

Intermontanus

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NEWS & ANNOUNCEMENTS

David Webb has volunteered to chair the Education Committee. The committee's first meeting will be held after the regular meeting on 17 November 1994. All UtAH members are welcome to participate.

UTAH AMPHIBIAN & REPTILE LAWS UP FOR REVIEW

The Utah Division of Wildlife Resources (DWR) is in the process of revising R-657-3 which deals with collection and importation of amphibians and reptiles. Actually the division was going to present their revisions to the Wildlife Board on 31 October 1994, without allowing the people of the state to have any say in the changes; despite UtAH asking to review the draft more than four times over the last year. Fortunately, several herpetologists called about a rumor started over some hedgehogs (of all things) and the DWR realized that we *do* want our voices heard. The proposed changes are now going to be presented through the proper channels and we will have an opportunity to voice our opinions.

In December/January the five DWR regions will hold public hearings on R-657-3, then in January/February the Wildlife Board will hear the public's comments and make their decision as to what changes will be made.

The current draft is similar to the existing rules, however some substantial changes have been made. The changes which may effect herpetologists are:

- All federal threatened and endangered species have been included in the definition of "prohibited species." Since permits are not issued to keep prohibited species for personal use, this change would make it illegal to keep any legally obtained (via FWS permit system) captive born threatened or endangered species (e.g., the Indian python). UtAH has brought this to the DWR's attention and they promised to correct the problem.

- Amphibians added to the list for protection from collection and subsequent possession are: Boreal toad - prohibited, lowland leopard frog - prohibited, northern leopard frog - controlled, relict frog - prohibited.

- The common snapping turtle is the only reptile added to the list of species protected from collection and subsequent possession. It is listed as prohibited.

- All native species of amphibians and reptiles are prohibited or controlled from importation. In addition the boreal chorus frog is given the status as prohibited (for unknown reasons) and the western toad is listed as prohibited. Several additional reptiles are added to the list as prohibited, most for no apparent reason. These are: All mud turtles (genus *Kinosternon*), painted turtles (*Chrysemys picta*), redbelly turtles & cooters (genus *Pseudemys*), sliders (genus *Trachemys*), and softshelled turtles (genera *Apalone* and *Pelodiscus*). The family Chelydridae remains prohibited from importation.

- Any person who wishes to possess a zoological animal (all herps) is required to obtain a permit from the DWR. Again the DWR promised to change this rule to indicate only controlled and prohibited species require a permit.

- The reptile propagation permit is limited to include only the California kingsnake, Great Plains rat snake, and the Mojave patch-nose snake. In addition these regulations are made more clear.

UtAH has attempted to cooperate with the DWR and promote sound changes to these laws, however the DWR does not seem to want our help. Thus it appears we will need to make a concerted effort to attend the regional board meetings and the wildlife board meeting and voice our opinions. We are currently in the process of drafting a letter which states our views. Rather than having everyone voice their opinions separately I think we will be more effective if we all agree to support specific changes rather than everyone submitting their own suggestions.

There may be a special issue of *Intermontanus* devoted to the revision of R-657-3 later this year. Until then, please do not call the DWR to voice your opinion. If you have questions and/or concerns please call Breck Bartholomew. This will ensure that we do not contradict each other and our impact will have the greatest effect.

HERP ACTIVITY SET FOR NEW YEAR'S DAY!

If you keep amphibians and/or reptiles New Year's Day is the day to inventory your collection (even if the collection is not very large!) for the annual *Reptiles and Amphibians in Captivity Breeding, Longevity, and Inventory* compiled by Frank and Kate Slavens.

Frank and Kate would like to receive as many responses as possible with emphasis on breeding records and experiences so that this information can be widely shared. This inventory is a great source to find out which species are being kept, which species are hardy and live long in captivity, and which species are being bred. In addition, the inventory indicates the numbers of each species being bred and who is breeding them. All sorts of information can be gleaned from the inventory, if people submit their inventories. Contrary to some people's fears, the inventory is *not* herpetoculture's "big brother."

The 1993 inventory contains information on 222 herpetological collections found throughout the world. Location, sex, longevity, and reproductive information is provided for 34,456 specimens. The 1994 inventory could include your collection too, simply submit:

- (1) A complete inventory of all reptiles and amphibians living in your collection as of January 1. Sexes of adult animals should be included and listed male (1.0.0) female (0.1.0) unknown (0.0.1). Juvenile animals should also be listed using the same format. For example, 1.2.1 + juv 0.0.10 would read: 1 adult male, 2 adult females, 1 adult of unknown sex, 0 juvenile males, 0 juvenile females and 10 juveniles of unknown sex.

- (2) A list of all species bred during the previous year. Information may be sparse with simply an indication that the taxon was bred during the year, or it may be quite lengthy including, but not limited to: dates of copulation, dates of egg laying and hatching, types of substrates and temperature used during incubation, light cycles, hibernation, etc. Any type of valuable information up to three or four paragraphs may be used.

- (3) A list of all specimens in your collection which you believe may set longevity records for the species. List the date of acquisition; your specimen ID number; the sex; estimated age at capture; wild or captive bred; living or dead; there is also room for brief notes.

- (4) A list of any publications (including books, museum bulletins, journals, magazines, etc.) with reference to reproduction of captive reptiles and amphibians.

- (5) Please be sure to list your name, address and telephone numbers

as you want them listed.

(6) Anonymous submissions will be considered, especially information of species bred.

(7) Please do respond.

All information should be sent to: Frank L. Slavens, P.O. Box 30744, Seattle, WA 98103 or FAX 206-546-2912

NEW PUBLICATIONS

The Amphibian and Reptile Research Organization of Sri Lanka (ARROS) announces the publication of *Lyriocephalus*. This new journal is the only journal dedicated to the taxonomy, ecology, conservation and other aspects of amphibians and reptiles of Sri Lanka. Each edition will include articles, short communications, book reviews, and announcements of activities and research projects of ARROS. Two issues per year are planned.

The first edition will contain contributions by scientists, herpetologists, and amateurs. The contents of volume 1 number 1 are: An introduction to the herpetofauna of Sri Lanka; The amphibian of Sri Lanka: a provisional checklist and their common names; The *Ichthyophis* in Sri Lanka: a short review; Natural history of *Ramanella obscura* (Amphibia: Microhylidae): some preliminary observations; Some notes on *Gonydactylus frenatus* (Günther, 1864) (Reptilia: Gekkonidae); Amphibians and reptiles observed at Galekanda, Panwilathane; Some vernacular names of terrapins in Sri Lanka; Pattern of snakebite in Kandy District; *Amphiesma stolata* (Linnaeus, 1758): additional Sinhala names; Some beliefs regarding chelonians in Sri Lanka; Preliminary report of snakes and agamid lizards in Galle District; Some popular beliefs, traditions and practices concerning amphibians and reptiles of Sri Lanka; Reptile fauna of the Knuckles Range: Sri Lanka; Some reptiles and amphibians observed at Mahaweli System B and C; and two book reviews.

Lyriocephalus is available for US \$10 and can be ordered from Anselm de Silva, President, ARROS, c/o Faculty of Medicine, University of Peradeniya, Peradeniya, Sri Lanka. ARROS can cash personal checks, but they prefer to receive cash because of the high

cost of exchange. Membership to ARROS is \$11/year or \$25 for life but it does not seem the journal is included in this price, however members are given a discount. (As a note, I am planning on ordering a couple of copies of the journal for resale. Please let me know if you want to buy a copy—Breck).

Currently in its 19th volume, *Hamadryad* is Asia's oldest peer-reviewed herpetological journal, and is published by the Centre for Herpetology, Madras Crocodile Bank Trust, India.

Recent papers in *Hamadryad* include: Checklist of the amphibians of India; Territory-marking in *Eublepharis macularius*; Distribution of *Varanus salvator* in the Philippines; Breeding biology of *Aspideretes nigricans* in Chittagong; Eggs and hatchlings of lizards from Borneo; Captive breeding of frogs; Biology and conservation of wart snakes; Social hierarchy in *Varanus salvator*; Natural history of the *Kachuga smithii*; Distribution of *Gavialis gangeticus*; Snake conservation in Sri Lanka; New species of *Cnemaspis* gecko from Indonesia; Sex ratios of Indian freshwater turtles; Feeding ecology of *Lissemys punctata*; Herpetology of Lambir Hills, Sarawak; Checklist of Pakistani geckos; New locality records of *Kachuga sylhetensis*; Growth of *Eretmochelys imbricata*; *Ophiophagus hannah* from a marginal habitat; and Man-eating by *Crocodylus palustris*.

Annual subscription: US\$ 25.00 (Inclusive of airmail postage for one volume). Checks to be made out in favour of "Madras Crocodile Bank Trust." Send correspondence to the Centre for Herpetology, Madras Crocodile Bank Trust, P.O. Bag 4, Mamallapuram, Tamil Nadu 603 104, India.

SSAR is pleased to announce its first video production, a recording of the lecture by Professor Walter Auffenberg (University of Florida) presented at the society's 1993 Annual Meeting in Bloomington, Indiana. In this 60-minute video, which is extensively illustrated with color slides, graphs, and other figures, Auffenberg describes and contrasts the behavioral ecology and feeding strategies of three markedly different species of monitors—the Komodo Monitor of eastern Indonesia, Gray's Monitor of the Philippines, and the Bengal Monitor of South Asia. Each species has been the subject of a major book by Auffenberg, and that on the Bengal Monitor was just published by the University Press of Florida. The video includes several film sequences of Komodo Monitors in the wild.

Videotapes may be purchased from Duane Busick Video Productions, 4400 Etter Road, Bloomington, Indiana 47408, USA, for US\$20 each in the USA, \$25 outside the USA (prices include all shipping and handling as well as airmail postage overseas). Payment may be made by personal checks or money orders, in advance; sorry, no credit cards or CODs. This is a VHS format tape (NTSC standard, appropriate for USA VCR machines); those who need PAL or SECAM versions may convert from NTSC copies or inquire of Busick Video for additional charges for PAL or SECAM versions (telephone area 812-336-8329).

The Smithsonian Institution Press has published a book by Whit Gibbons titled *Keeping All The Pieces: Perspectives on Natural History and the Environment*. Although not specifically about herps, this book may be of interest to several UTAH members (see book review on page 42). The book costs \$16.95 and can be ordered from most book stores or directly from the Smithsonian Institution Press, Blue Ridge Summit, PA 17294-0900, phone: 1-800-782-4612.

The University of Texas Press recently published *The Lizard Man Speaks* by Eric R. Pianka. This book is a real life adventure story about living in remote wilderness areas and studying wild lizards in their natural habitats, by the world's leading authority on the ecology of desert lizards. This book can be ordered from the University of Texas Press, P. O. Box 7819, Austin, TX 78713-7819 (\$24.95). See book review on page 43 for more information about this book.

Utah Association of Herpetologists

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HEADLINE HERPS

by David Webb

We Deliver For You?

Live and dead turtles and birds were found among undelivered mail in a Postal Service worker's northwest Washington condo. The 22 year employee was arrested and charged with theft. [USA TODAY, October 19, 1994]

Alligator Busts

* New York City Police and Fire Department officials along with the ASPCA and the Prospect Park Zoo confiscated six alligators and other animals that they found in an apartment, except a three-foot iguana. While conducting building inspections, city fire-fighters spotted a cage on the fourth floor fire escape of a building. They went up to the apartment and found the alligators. Police said the apartment was found unlocked. Mike Gimbel, a lawyer with the city's Department of Environmental Protection, wasn't happy when he returned to find that his apartment had been entered and searched. He promised a legal battle. For over 20 years Gimbel's apartment has served as an inter-city zoo for the neighborhood children. "There's no zoo in this neighborhood. The schools bring kids on field trips here," Gimbel said. Gimbel also said that one of the alligators was given to him by the ASPCA. Joanne Yohannan, the director of the society's Brooklyn animal shelter, said that they would give any alligators to the Bronx Zoo's Reptile House, which is what they did with Gimbel's gators. Yohannan also said that it's illegal to keep wild animals in the city. [Deseret News, October 28, 1994]

* David Van Buren's 7-foot alligator escaped from his home and was found by his neighbor who called the police. Van Buren is battling the state for return of his gator, which 36 neighbors have signed an appeal of clemency for. [USA TODAY, October 7 & 13, 1994]

Undercover Bust

After two years of undercover work California authorities arrested 15 suspects and confiscated 2,000 reptiles, including a Gila monster, snapping turtles, rattlesnakes, and rosy boas, in raids on poachers and illegal collectors in 11 counties. The state Department of Fish and Game set up a phony store in Temecula, CA. called Temecula Reptilia that purchased and sold animals in the underground reptile market.

Collectors with valid fishing licenses are allowed to collect a limited number of reptiles as per state law. However, it's illegal to sell and buy native reptiles. Violators can be charged with a misdemeanor, which carries a maximum fine of a \$1,000 and 6-months in jail. "Poaching of native wildlife is a runaway cottage industry in California that threatens our wildlife resources," said Eddie Watkins, the officer in charge of the special operation. "In this operation, we targeted some of the major players who've made a commercial enterprise out of catching, breeding and selling thousands of reptiles to collectors throughout the country." [Deseret News, September 21-22, 1994, and The Salt Lake Tribune, September 23, 1994]

Light Fine

A Melbourne Beach, Florida condo complex may be fined \$45,000 due to stairwell lighting that caused baby loggerhead sea turtles to become disoriented, officials said. Environmentalists say some turtles were eaten by raccoons or died of exposure. [USA TODAY, October 11, 1994]

Snake In A Tree

ROLLY & WELLS report that Robert Myers of Kearns recently had a snakey encounter while trimming his pear tree. Myers climbed a ladder to trim his tree and nosed right up to a python. Someone at Wildlife Division told him it was a blow snake (Don't you mean Great Basin gopher snake?—DW). Next three sheriff deputies arrived and one of them ended up with the snake wrapped around her. The other deputies, both men, had to assist in uncoiling the snake from around the deputy. [The Salt Lake Tribune, October 3, 1994]

If you see an interesting herp article cut it out along with the name and date of the publication with your name written on it and send it to me in care of UTAH at the address on the masthead. If possible, please photocopy the entire article or use transparent tape to hold the original together. The name and date of the publication must be attached or the article can't be used.

Recent Publications from SSAR

Captive Management and Conservation of Amphibians and Reptiles, by James B. Murphy, Kraig Adler, and Joseph T. Collins (eds.). Foreword by Gerald Durrell. 1994. 408 p. \$58.00.

Biologia Centrali-Americana: Reptilia and Batrachia, by Albert Günther. 1885-1902. Introductions by Hobart M. Smith, A. E. Gunther, and Kraig Adler. 575 p. \$50.00.

Biology, Status, and Management of the Timber Rattlesnake (*Crotalus horridus*): A Guide for Conservation, by William S. Brown. 1993. 84 p. \$8.00.

Handbook to Middle East Amphibians and Reptiles, by Alan E. Leviton, Steven C. Anderson, Kraig Adler, and Sherman A. Minton. 1992. 264 p. \$28.00.

Scientific and Common Names for the Amphibians and Reptiles of Mexico in English and Spanish / Nombres Científicos y Comunes en Inglés y Español de los Anfíbios y los Reptiles de México, by Ernest A. Liner. Spanish translation of names by José L. Camarillo. 1994. 118 p. \$12.00.

Herpetology of China, by Ermi Zhao and Kraig Adler. 1993. 522 p. \$60.00.

Standard Common and Current Scientific Names for North American Amphibians and Reptiles (3rd ed.), compiled by Joseph T. Collins. 1990. 45 p. \$5.00.

Herpetology: Current Research on the Biology of Amphibians and Reptiles. 1992. Proceedings of the First World Congress of Herpetology (1989), with a foreword by H.R.H. Prince Philip, Duke of Edinburgh. 225 p. \$28.00.

The Gila Monster and its Allies, by Charles M. Bogert and Rafael Martín del Campo. 1956. New preface by Charles Bogert and retrospective essay by Daniel D. Beck. 262 p. \$38.00.

The Reptiles and Amphibians of South Australia, by Edgar R. Waite. 1929. Introduction by Michael J. Tyler and Mark Hutchinson. 282 p. \$35.00.

Longevity of Reptiles and Amphibians in North American Collections (2nd ed.), by Andrew T. Snider and J. Kevin Bowler. 1992. 44 p. \$5.00.

Snakes of the *Agkistrodon* Complex: A Monographic Review, by Howard K. Gloyd and Roger Conant. 1990. 620 p. \$75.00.

Society publications may be purchased from: Dr. Robert D. Aldridge, Publications Secretary, Department of Biology, St Louis University, St Louis, Missouri 63103. Make checks payable to "SSAR." Orders may be charged to MasterCard or VISA (provide account number and expiration date). A complete price list of SSAR publications is available on request to Dr. Aldridge.

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FEATURES

The following article is reprinted, with permission from the author, from *Herpetofauna* (1994) 24(1):19-21. With the formation of the UtAH Education Committee, this article is particularly timely and applies to U.S. herpetological education as well as Australian.

FROM FEAR TO FRIEND

Anthony Stimson
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Australia

This paper was presented at the One Day Theme held on 29.12.1993 to coincide with the Second World Congress of Herpetology in Adelaide.

Reptile and amphibian exhibits and presentations at zoos and fauna parks have an extremely important role to play in educating people about herpetofauna.

To be effective it is important to assess the starting point of any educational experience before you begin. The background knowledge, experiences, values and attitudes of any audience should be considered as part of this assessment. When considering attitudes to herpetofauna, phobic conditions are too often encountered. Herpetophobia (the fear of reptiles and amphibians) especially the fear of snakes (ophidiophobia) is one of the most common phobias. But with snakebite resulting in only one to two deaths per year in Australia...where does this relatively baseless revulsion originate?

Unfortunately the religious background of the community holds a lot of the blame. Reptiles, particularly snakes, are biblically linked with evil and are thought to be creatures of ill-omen. Even children's stories are responsible for many childhood fears. The Australian classic children's story "Snugglypot & Cuddlepup" with the "evil Mrs Snake" is a good example.

It is clear that herpetofauna education is up against an extremely hostile cultural background but, reptile and amphibian phobias are learned therefore they can be "unlearned" (Simpkin, 1993).

Fortunately, gone are the days when education was of low priority when the "Pit of Death" appeared at country fairs and reptile exhibits were overcrowded, writhing masses of snakes and lizards (Cann, 1986). The zoos and fauna parks that I have visited in Australia, USA and the U.K. have come a long way since those days. Too often however they have chosen an educational path that does not effectively take into account the hostile cultural and social backgrounds and, as a result do not do enough to counter herpetophobia. In fact, they will often reinforce the existing fears.

Aesthetically pleasing exhibits such as habitat displays, signage and presentations avoiding words and wording with unsympathetic meanings will significantly help to overcome these social and cultural barriers.

The exhibition of any reptile or amphibian should impart a sense of dignity and respect for the animals and dismantle any negative feelings (Simpkin, 1993).

Exhibits

Herpetofauna exhibits are in a unique position to portray reptile and amphibians in a very positive and aesthetically pleasing environment. Most exhibits do just that, although I have only recently seen exhibits that displayed reptiles in a variety of squalid conditions. For example, cages without fresh water, without substrate, and with a build-up of faeces. It is my belief that no animal deserves to be displayed in this way. By demonstrating (as in the

previous example) that they are not worthy of our care we are teaching our already phobic visitors that reptiles do not deserve their respect either.

A commonly encountered feature of many reptile exhibits is some form of barrier to keep visitors back from the glass. Barriers imply danger and will often reinforce visitors' phobias. Unfortunately though, in some cases barriers are unavoidable. At Featherdale Wildlife Park we have totally dispensed with barriers and allow and actively encourage close eye to eye viewing of even the most venomous species.

People are often lured to reptile exhibits through a morbid fascination and will visit with a similar curiosity to that which attracts people to the "Chamber of Horrors". It is my belief that aesthetic appeal is a far more beneficial lure to an exhibit, and psychologists suggest that phobias are best overcome in an atmosphere that is very positive and comfortable (Smith, 1977).

At Featherdale the positive, comfortable atmosphere is set by making the entrance to the display accessible via the kangaroo and koala sanctuary. Healesville Sanctuary in Victoria have gone one step further by actually employing the services of a theatrical designer to give the reptile complex the most aesthetically pleasing atmosphere possible (Simpkin, 1993).

Signage/Graphics

A more subtle aspect which can reinforce phobias is the language used in exhibit graphics and signage. Emotive words such as dangerous, aggressive, attack and deadly occur very commonly in reptile exhibit signage. These words are unsympathetic and detract from the message that we prefer to present. Exhibit graphics also often place too much emphasis on unsympathetic facts. A very good example of this is the tendency to concentrate the message on the subject of venom, which is just one of many snake adaptations. Also, by acknowledging phobias directly in signage, we risk setting it more deeply in the visitor's minds (Simpkin, 1993). Any signs should keep the information relevant to the animal in its natural habitat, as it would on the signs and graphics for any other animal.

To illustrate the problems created by the language used in signage, consider the following two examples of extremes.

Sensational/Clinical approach:

Fierce snake *Oxyuranus microlepidotus*

This species of snake has the most toxic venom of any terrestrial snake in the world. This large deadly species delivers an average of 218,000 mouse LD50 doses of venom per bite - an equivalent to an "atomic bomb" for overkill. A single dose can certainly kill many people.

The venom is mainly neurotoxic and causes paralysis and then death. Its distribution centres on far western Queensland where it feeds mainly on rats.

Empathetic approach:

Inland Taipan

This shy and rarely encountered species is found in the remote and arid areas of far western Queensland.

The delicately patterned scales aid camouflage and make this species one of Australia's most beautiful snakes.

Remarkably this species has the ability to increase the pigment in its scales to make itself darker in the cooler winter months to absorb more warmth from its environment. Feeding mainly on rats, the Inland Taipan or "Small Scaled Snake" has a potent venom to efficiently subdue its prey. Its venom can also be used to defend itself.

Both these accounts are factually accurate, but the message each

communicates is very different. Ignorance may "breed contempt", but overcoming contempt is not a simple consequence of overcoming ignorance.

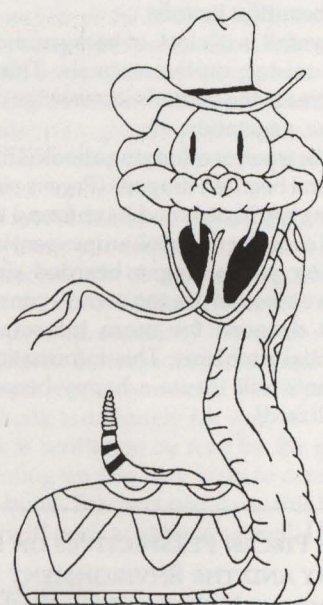
Presentations

The same language and wording problems are encountered in reptile presentations involving a keeper or fauna educator talking about and talking with live handled specimens. This could be in a zoo, fauna park, in a shopping centre or in a school.

Reptile educators and herpetologists in Australia seem to love to dwell in their presentations on "venom facts" and where each venomous species ranks in the top ten most dangerous snakes in the world. One presentation I have seen, barely mentioned anything else other than the various snake venoms and their effects on humans. This information may be interesting to herpetologists, but does little to improve attitudes towards reptiles.

As with exhibits, creating an atmosphere that is comfortable and positive is also important in presentations. At Featherdale Wildlife Park the snake presentation is conducted in one of the most positive atmospheres possible, i.e. in the Koala Sanctuary! People enter the Koala Sanctuary to see and hold a koala and whilst on the "high" created by the koalas usually will not hesitate to touch or hold a python. We also avoid any emotive words such as aggressive, kill etc. as these detract from our message. Certainly many other presentations I have seen allow people to touch a python, but there is a significant proportion that will not take the opportunity.

The way animals are handled during a demonstration has a significant impact on audience perceptions. Some demonstrations have the reptiles teased or flicked around the pit with a snake hook. Sure, this may show that the handler has a mastery of the reptile, but it conveys the image that the animal is not worthy of our care. The focus is on the "bravery" of the handler, not the nature of the snake. A good demonstration of handling should have the animal held as gently as possible or if practical, moving freely around the presenter.



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As Education Officer at Featherdale, I get the opportunity to educate children about reptiles and amphibians. Young children are often not yet phobic and any positive contact with these animals will have a large impact on their future attitudes.

Featherdale has been fortunate to be involved with the popular Australian TV soapie "A Country Practice" - native animals are frequently used and there is a snake in the story (e.g. Diamond python). Featherdale staff nearly always had a say in how the animals were portrayed in the storyline. We made sure the snake was made to be as friendly as possible and it was given the euphemistic name "Cuddles".

Whenever a Diamond python is used in presentations at Featherdale, we always call it "Cuddles". It is amazing to see how fast the mental barriers are broken down when the name "Cuddles" is mentioned. Compare this response to that received by calling a snake "Fang".

"Cuddles" isn't the only euphemism we use, and we always use words such as Beautiful, Lovely, and Friendly, again effectively breaking down the barriers and constructing positive attitudes towards snakes.

Conclusion

It is great to see most exhibits and presentations aiming to educate. But without first considering the rather hostile cultural background of people towards reptiles, the result is often reinforcing any fears held by visitors.

The approach taken at Featherdale and other fauna parks takes careful consideration of people's attitudes. This goes a long way to changing these attitudes for the better and in the long term improving the conservation prospects of these species.

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HUSBANDRY & HERPETOCULTURE

CALCULATING THE PROPER DOSAGE OF MEDICINE FOR REPTILES

The most important aspect of calculating the proper dosage of a medicine for an animal is the animal's metabolic rate, because the half-life of most pharmaceuticals is dependent on how fast it is metabolized rather than time. This poses particular problems for reptiles since they are ectothermic and generally have low metabolism, and since the dosage for most medicines is calculated for mammals. Some of the first attempts to calculate dosages of pharmaceuticals for reptiles were accomplished by trying several different dosages and finding out what worked best (e.g. Bush et al. 1980). However, Mader (1991) presented a method for scaling the dosage based on metabolism. Mader assumed that there was a direct correlation between metabolism and weight of the reptile,

although there was little supporting data (Timm et al. 1994).

Recently Timm et al. (1994) tested Mader's ideas by calculating the relationship between surface area, volume, and weight of 140 snakes (106 colubrids and 34 boids). The snakes ranged in size from 33.2 cm to 3.96 m (6.9 g to 36.8 kg). Timm et al. found strong correlations between surface area and volume ($R^2=0.9956$) and volume and weight ($R^2=0.9972$). They went on to use this data to show that snakes do appear to follow the predicted weight/metabolic rate relationship, thus verifying Mader's calculations for determining drug dosages.

It is very easy to give a reptile a toxic dosage of a medicine and I doubt most veterinarians know how to calculate the metabolic rate or minimum energy cost (MEC) for reptiles. If you have to treat a reptile with antibiotics or any other drug you should calculate the MEC using Mader's equations. You cannot assume the dosage for one snake is going to work for all snakes. This is especially true for large snakes. For example, a young python will require a dosage which could be toxic to an adult python if you use the same dose/weight.

Below are simplified versions of Mader's equations for calculating the correct dosage of medicine for reptiles:

- 1). Calculate the dosage you would give a 20 kg dog and call that number D.
- 2). $D \div 662 = \text{MEC}_{\text{dog}}$ dosage in mg/kcal/day
- 3). Calculate the MEC for your animal by: $10 \times (\text{weight in kg})^{.75} = \text{MEC}_{\text{reptile}}$ in kcal/day
- 4). Multiply the MEC_{dog} dosage (step 2) by the $\text{MEC}_{\text{reptile}}$ (step 3) = dose/treatment. This is the amount of medicine you will give your reptile each treatment. The amount is usually in mg or units.
- 5). Calculate the treatment period. Because reptiles have a low metabolism medicine stays in their system much longer than in mammals. As a result you may only need to treat your animal every couple of days or even once a week, instead of every day. The treatment period is calculated by: $(\text{Treatment interval in hours}) \times 33 \div \text{MEC}_{\text{reptile}} \times \text{weight of your animal}$. This number is the number of hours between treatments. If you want to know the number of days between treatments divide the number by 24.

For example, if we had a drug with a recommended dosage of 10 mg/lb for dogs which is to be given once every day we can calculate the dosages for our 610 gram rat snake and our 25 lb python.

- 1). First we must recalculate all weights into kg (2.2 lbs = 1 kg): dosage = 22 mg/kg, 0.61 kg rat snake, and 11.4 kg python.
- 2). $D = 440 \text{ mg/day}$
- 3). $\text{MEC}_{\text{dog}} \text{ dosage} = 440 \div 662 = 0.664 \text{ mg/kcal/day}$
- 4). $\text{MEC}_{\text{rat snake}} = 10 \times (0.61)^{.75} = 6.9 \text{ kcal/day}$ and $\text{MEC}_{\text{python}} = 10 \times (11.4)^{.75} = 62 \text{ kcal/day}$
- 5). Calculate dose/treatment for each snake: $0.664 \times 6.9 = 4.6 \text{ mg}$ for the rat snake and $0.664 \times 62 = 41.2 \text{ mg}$ for the python.
- 6). Now the treatment interval for each snake is: $24 \times 33 \div 6.9 \times 0.61 = \text{every } 70 \text{ hrs}$ or every 2.9 days for the rat snake, and for the python $24 \times 33 \div 62 \times 11.4 = \text{every } 146 \text{ hrs}$ or 6 days.

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BOOK REVIEWS

THE GENERAL CARE AND MAINTENANCE OF BEARDED DRAGONS

Philippe de Vosjoli & Robert Mailloux. Advanced Vivarium Systems, Lakeside, CA.

Like the stars, the bearded dragon has grown in popularity recently like never before; from cover stories in some magazines to centerfolds in others. Caught up in the bearded dragon frenzy, I found a book, not a new book but a book on this new found star in the herp world. The book is *The General Care and Maintenance of Bearded Dragons* by Philippe de Vosjoli and Robert Mailloux.

The authors begin with a short introduction to the book and then move on to a very important and needed section called, "herpetoculturists and the law." In this section they explain a little of Australia's laws. Even though I don't totally agree with the strict laws imprisoning Australia's wildlife from the rest of the world, I find it essential that readers know the laws to protect themselves from any trouble with the law.

The book then moves on to some general information on the different species in the genera to various techniques to successfully keeping bearded dragons. The majority of the information is geared towards the inland bearded dragon, (*Pogona vitticeps*), but could easily be applied to any of the *Pogona* species. The diagrams contained are easy to understand and very practical. The book also gives company names and part numbers for full spectrum lighting and other supplies for keeping bearded dragons. The book contains techniques for raising one bearded dragon or a farm of bearded dragons. The authors cover all grounds for successfully feeding, breeding and keeping these magnificent creatures with personalities like I have never seen in the reptile world! The book contains a more than sufficient amount of black and white photographs. But as we all know, black and white pictures never do an animal justice, so I was glad to find out the book contained twelve pages of color photographs of these beautiful lizards.

The book's only downfall is it's lack of background information that I find helpful in raising captive animals. This background information would increase the owner's knowledge of the animals habitat, prey, predators, vegetation, etc.

In conclusion, I find the true test of judging a book is it's practicality, so I purchased two inland bearded dragons (*Pogona vitticeps*). I have had no problems raising my lizards and have found the book to be excellent for reference. I consider this book an inexpensive investment for anyone considering purchasing a bearded dragon. I also recommend prospective bearded dragon owners consult those who have raised bearded dragons for more information, raising techniques, and potential problems. This information, combined with the book's contents will insure a happy herper, and more importantly, a happy lizard!

Eric Peterson

Pleasant Grove, Utah

KEEPING ALL THE PIECES: PERSPECTIVES ON NATURAL HISTORY AND THE ENVIRONMENT

Whit Gibbons. Smithsonian Institution Press, Washington, DC, 182 pp. (\$16.95)

Although this book is not specifically about reptiles and amphibians it is about the environment and biological diversity which includes these groups. In addition, Whit Gibbons is a herpetologist and amphibians and reptiles are prominent in the book.

The book has three main goals: to foster a deeper appreciation of our natural world, to affirm the intricate and delicate nature of the

relationships and interactions among plants, animals, and their environments by offering a nontechnical yet detailed perspective on natural history, and to identify human attitudes and actions that can lead us in either of two ways: towards environmental degradation on a planetary scale or towards a stronger communion between humans and nature. The book is specifically written for the non-biologist, although biologists may still find it useful.

Gibbons begins the book with a short but depressing view of what the world may soon be like if current trends of environmental destruction continue. Unlike other books about biodiversity this is the only depressing chapter of the book. The next several chapters offer examples of unique and wonderful interrelationships between plants and animals which inhabit the earth today.

The second part of the book discusses extinction as well as endangered and threatened species and their relationships to humans and other species. Gibbons introduces a new term, *ecovoid*, for missing components of the ecosystem which we wish were present but can never be replaced. An example of an ecovoid is the passenger pigeon, which used to be extremely abundant in the eastern U.S. before the early 1900's when they were exterminated. The author is careful not to blame people for past extinctions or destruction of the environment, he merely presents what has happened. How people perceive nature is also discussed in this section and it becomes clear that people often see what they want to see rather than what is really there, causing problems for conservationists trying to determine the range of a species.

Part three examines the people responsible for environmental degradation. This section also examines people's attitudes towards other people and the environment. The author illustrates the difficulties involved determining environmental attitudes of people in a region as well as the difficulties in trying to protect areas which are considered pristine. The last chapter in this section discusses the root of our environmental problems, population growth. This topic is a touchy one for many people, but it is dealt with very well and is used to show that we are responsible for the health of the environment.

The final section of the book describes what each individual can do to help protect the environment. From recycling to getting involved with an environmental organization, most of the things included in this section are simple and could be done by everyone. The book ends on an optimistic (probably too much so) view of what the world could be like if more people participated in protecting the environment.

All in all I found this book very refreshing. While some books on biodiversity leave you feeling depressed, this book offered hope. The author succeeds in obtaining the goals for the book and more. Throughout the book Gibbons is careful not to blame anyone for what has happened, especially those who didn't know any better. Today we all know better in many cases and we should do something to prevent further environmental loss. If you are not sure what you can do this book is definitely for you.

This book is written to be read by the general public. With the holidays coming up you may want to consider giving or getting a copy of this book. Teachers could use this book in their classes and individuals will find it valuable as well. I highly recommend it.

Breck Bartholomew
Logan, Utah

THE LIZARD MAN SPEAKS

Eric R. Pianka. University of Texas Press, Austin, 179 pp. (\$24.95)

Eric R. Pianka has been studying the ecology and natural history of desert lizards since the early 1960's. His work has taken him to the hot deserts of North America, Australia, and Africa. In addition to his many scientific papers, Pianka has written a book, *Ecology and Natural History of Desert Lizards*, which compares and contrasts the

ecology and natural history of lizards in three desert regions. This autobiography focuses primarily on his experiences in the Australian outback, but it also includes a chapter about his studies in the Kalahari and Namib deserts of Africa.

The book starts out with a history of Pianka's childhood, a childhood filled with both an interest in nature and tragedy. A close call with a bazooka shell landed Pianka in the hospital for much of his adolescent years, yet his interest in nature prevailed. After graduating from high school he and his brother took a two-month trek through much of the western US and México. He completed his master's thesis on North American lizards then he began his Ph.D. work on Australian lizards.

The bulk of the book is about Pianka's experiences in Australia, specifically in the outback, mostly alone or with only a few people. From traveling around the outback looking for field sites to chasing down lizards, getting lost and dealing with the ever-present bush flies Pianka presents a realistic (read unglamorous) view of working in the outback. Also included are chapters on the history of Australia's ecology and the Aborigines.

While many species of lizard are discussed the goannas (*Varanus*) seem to play a major role in much of the book. From stories of their natural history to the difficulty in finding, and then capturing, the perentie (*Varanus giganteus*) the book contains a lot of information on the natural history and ecology of Australian desert lizards. In fact, this book is a nice complement to Pianka's other book on desert lizards.

Although there is only one chapter on African deserts it offers a variety of experiences not encountered in Australia and cannot be forgotten once the book is finished. Imagine trying to find geckos at night while also trying to find predators before they find you. Or trying to dig your truck out of a hole while two lions sit 100 yards away and the person watching the lions screams because an ostrich happens to come into view.

Rather than try to explain the variety of stories, and information presented in this book I will simply say that anyone who dreams about experiencing the Australian Outback or who likes lizards, especially monitors, should read this book. As the author presumes in the preface, this book is a nice escape from urbanization and, if read at night, it can certainly enhance your dreams.

Breck Bartholomew
Logan, Utah

CLASSIFIED ADS

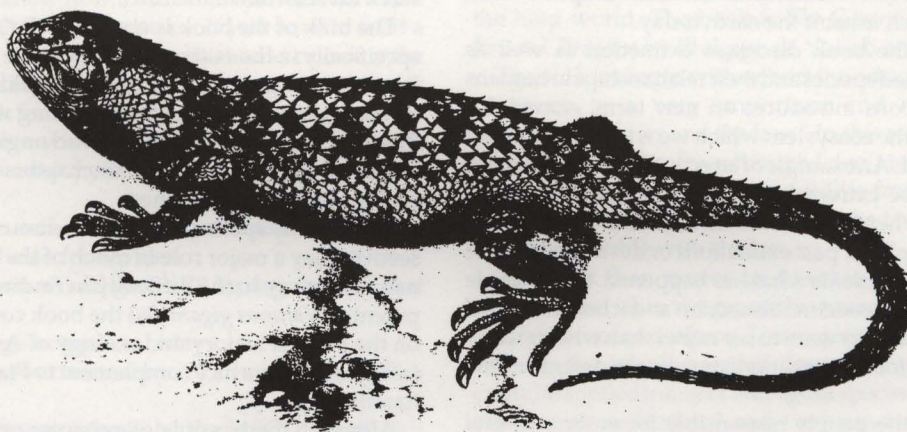
For Sale: Ball python, desert spiny lizard (from Nevada - legal), mountain armadillo lizard, Nile monitor, and Mexican spinytail iguana. All are priced to sell. Call (801) 752-6442 after 4:00 PM.

For Sale: Red-tailed boa: 18 mo old, 3 ft long, eating weaned rats, very calm. Handled by children. \$200. Call Chrisann (801) 223-4858 evenings.

BREEDING, INVENTORY SURVEY everyone keeping live reptiles and amphibians is asked to contribute to this annual report. Please submit the following information current January 1st of each year. (1) Inventory of your collection, list numbers and sex. (2) List all species bred during the previous year. (3) any longevity records. (4) Please print clearly, your name, address, and telephone number as you want them listed. (5) Please do respond. Send all information to: Frank Slavens, P. O. Box 30744, Seattle, WA 98103. FAX 206-546-2912.

For Sale: Captive born Brazilian rainbow boas (*Epicrates cenchria cenchria*) \$225 ea. and Coastal rosy boas (*Lichanura trivirgata roseofusca*) \$85 ea. Call Breck (801) 752-0297.

Next Meeting: Thursday, 17 November 1994 at 7:00 pm in room 212 of the University of Utah's Biology Building. **Louis Porras** will present part II of his talk about "**Herpetological Trips to Mexico.**" After the talk there will be a drawing for a book and a desert tortoise T-Shirt. Also, Jim Larson has donated a captive born California Kingsnake, *Lampropeltis getula californae*, which will be raffled. Tickets will cost \$1 each and you may purchase as many as you like. Call UTAH if you need directions to the U of U Biology building. **See you there!**



Sceloporus clarki from Coues (1875) Synopsis of the reptiles and batrachians of Arizona.

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